

9th Class 2017

Biology	Group-II	Paper-I
Time: 1.45 Hours	(Subjective Type)	Marks: 48

(Part-I)

Q.2. Write short answers to any FIVE (5) questions: (10)

(i) Write down the definition of Biology.

Ans Biology is the scientific study of life. The word "biology" has been derived from two Greek words, "bios" meaning "life" and "logos" meaning thought or reasoning.

(ii) Differentiate between botany and zoology.

Ans The study of plants is called as botany while the study of animals is called as zoology.

(iii) Write down the definition of biological method.

Ans The scientific method in which biological problems are solved, is termed as biological method. It comprises the steps a biologist adopts in order to solve a biological problem.

(iv) Differentiate between quantitative observations and qualitative observations giving one example.

Ans Observations may be both qualitative and quantitative:

Qualitative Observations	Quantitative Observations
The freezing point of water is colder than the boiling point.	The freezing point of water is 0°C and the boiling point of 100°C .

Quantitative Observations are considered more accurate than qualitative ones.

(v) What is meant by biodiversity?

Ans Biodiversity plays an important role in making and maintaining ecosystems. It is directly involved in recycling of nutrients and providing fertile soils.

(vi) Write down the importance of biodiversity.

Ans Biodiversity plays an important role in making and maintaining ecosystems. It is directly involved in recycling of nutrients and providing fertile soils.

(vii) Differentiate between magnification and resolution.

Ans Magnification:

It is the increase in the apparent size of an object and it is an important factor in microscopy.

Resolution:

It is the measure of the clarity of an image.

(viii) What is meant by micrograph?

Ans A photograph taken through a microscope is called a micrograph.

Q.3. Write short answers to any FIVE (5) questions: (10)

(i) How cytokinesis occurs in a plant cell?

Ans Cytokinesis in plant cells occurs differently. Vesicles derived from the Golgi apparatus move to the middle of cell and fuse to form a membrane-bounded disc called cell plate or phragmoplast. The plate grows outward and more vesicles fuse with it. Finally, membranes of cell plate fuse with plasma membrane and its contents join the parental cell wall. The result is two daughter cells, each bounded by its own plasma membrane and cell wall.

(ii) What changes occur in a cell during S-phase?

Ans In this phase, cell duplicates its chromosomes. As a result, each chromosome consists of two sister chromatids.

(iii) What is metastasis?

Ans The tumor can send cancer cells to other parts in body where new tumors may form. This phenomenon is called metastasis (spreading of disease).

(iv) Differentiate between extra cellular and intracellular enzymes.

Ans Extracellular enzymes:

Working outside of the cell (e.g., pepsin), enzyme working in the stomach cavity.

Intracellular enzymes:

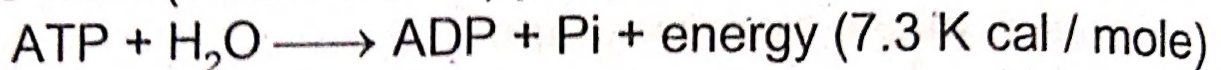
If enzymes are worked in the cytoplasm of the cell, then they are called Intracellular enzymes (e.g., enzymes of glycolysis working in the cytoplasm).

(v) **Describe the use of enzyme in food industry.**

Ans The enzymes that break the starch into simple sugars are used in the production of white bread, buns, etc.

(vi) **How much energy is released from one mole of ATP?**

Ans The breaking of one phosphate bond releases about 7.3 K cal (7300 calories) per mole of ATP as follows:



(vii) **What is lactic acid fermentation?**

Ans Lactic acid fermentation occurs in skeletal muscles of humans and other animals during extreme physical activities. This also happens in the bacteria present in milk. In this type of anaerobic respiration, each pyruvic acid molecule is converted into lactic acid ($\text{C}_2\text{H}_6\text{O}_3$).

(viii) **What is photolysis of water?**

Ans In photosynthesis, light breaks water molecule (photolysis) and oxygen is released. The hydrogen atoms of water give electrons to chlorophyll and become ions.

Q.4. Write short answers to any FIVE (5) questions: (10)

(i) **Define malnutrition.**

Ans Problems related to nutrition are grouped as malnutrition. It most often refers to under nutrition resulting from inadequate consumption, poor absorption or excessive loss of nutrients. Malnutrition also includes over-nutrition, resulting from overeating or excessive intake of specific nutrients.

(ii) **What is meant by bolus?**

Ans During the processes of chewing, lubrication and semi-digestion, the pieces of food are rolled up by the tongue into small, slippery, spherical mass called bolus.

(iii) Define organic fertilizer with an example.

Ans Organic fertilizers are derived from plants and animal materials. They are more complex and take time to be broken down into forms usable by plants. Manure and compost are used as organic fertilizers.

(iv) Write two functions of large intestine.

Ans The important functions of large intestine are as follows:

1. When the digested food enters into the large intestine, the water is absorbed from it and enters into the blood.

1. Faeces is stored in the rectum, a part of large intestine.

(v) Write the function of neutrophils and basophils.

Ans **Neutrophils:**

They destroy small particles by phagocytosis.

Basophils:

They prevent blood clotting.

(vi) How pus is formed?

Ans White blood cells die in the process of killing the germs. These dead cells accumulate and make the white substance called pus, seen at infection sites.

(vii) Why AB blood group individuals are called universal recipients?

Ans AB blood group individuals are called universal recipients because they can receive transfusions from the donors of every other blood group.

(viii) Write the symptoms of dengue fever.

Ans In dengue fever, there is a sharp decrease in the number of platelets in blood. Because of this, patients bleed from the nose, gums and under the skin.

(Part-II)

Note: Attempt any TWO (2) questions.

Q.5.(a) Explain the population level and community level. (4)

Ans **Population Level:**

The level where biologists study interactions among member of same species living in same habitat. A population is defined as a group of organisms of the same species located at the same place in the same time.

For example, human population in Pakistan in 2010 comprises of 173.5 million individuals (according to the Ministry of Population Welfare, Govt. of Pakistan).

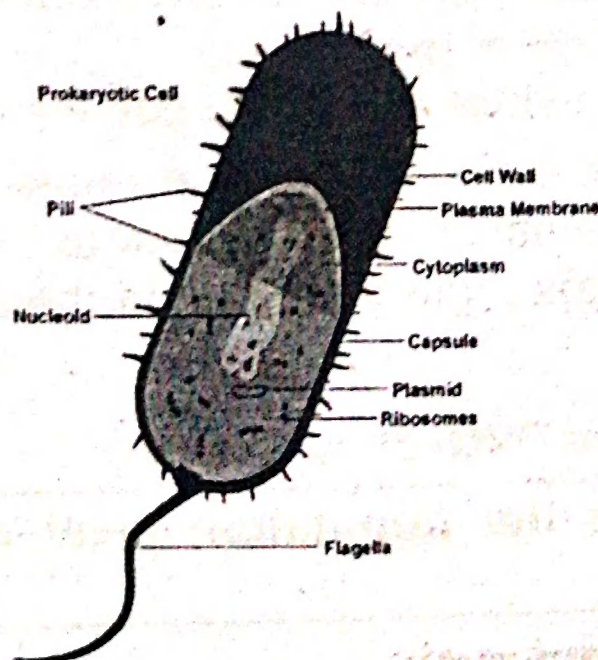
Community Level:

A community is an assemblage of different populations, interacting with one another within same environment. A forest may be considered as a community. It includes different plant microorganisms, fungi and animal species. Some communities are complex e.g., a forest community, pond community, etc. Other communities may be simple e.g., a fallen log with various populations under it.

(b) Describe in detail the difference between prokaryotic and eukaryotic cells. (5)

Ans Prokaryotic and Eukaryotic cells:

Prokaryotes possess prokaryotic cells which are much simpler than the eukaryotic cells. The main differences between prokaryotic and eukaryotic cells are as follows:



1. Nucleus:

Eukaryotic cells have prominent nucleus (bounded by nuclear envelope) while prokaryotic cells do not have prominent nucleus. Their chromosome consists of DNA only and it floats in cytoplasm near centre. This region is called nucleoid.

Other Organelles:

Eukaryotic cells have membrane-bounded organelles like mitochondria, Golgi apparatus, endoplasmic reticulum, etc., while such membrane-bounded organelles are not present in prokaryotic cells.

The ribosomes of eukaryotic cells are larger in size as compared to the ribosomes of prokaryotic cells.

Size:

Eukaryotic cells are, on average, ten times larger than prokaryotic cells.

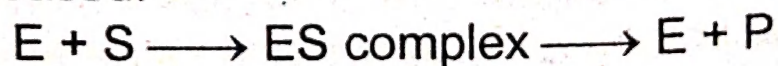
Cell Wall:

The cell wall of eukaryotic cell is made of cellulose (in plants) or chitin (in fungi). All prokaryotic cells have cell wall, which is made of peptidoglycan (a large polymer of amino acids and sugars).

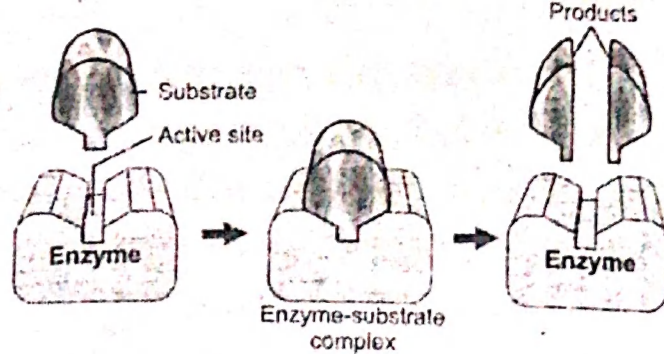
Q.6.(a) Describe models regarding mechanism of enzyme action. (4)

Ans Mechanism of Enzyme Action:

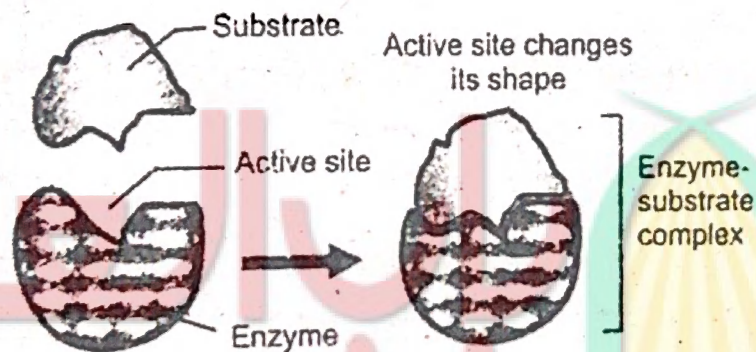
When enzyme attaches with substrate, a temporary enzyme-substrate (ES) complex is formed. Enzyme catalyzes the reaction and substrate is transformed into product. After it, the ES complex breaks an enzyme and product is released.



In order to explain the mechanism of enzyme action, a German chemist Emil Fischer, in 1894, proposed "Lock and key" model. According to this model, both enzyme and substrate possess specific shapes that fit exactly into one another. This model explains enzyme specificity.



In 1958, an American biologist Daniel Koshland suggested a modification to Lock and key model and proposed induced-fit model. According to this model, active site is not a rigid structure rather it is molded into the required shape to perform its function. Induced-fit model is more acceptable than "lock and key" model of enzyme action.



(b) Give events of light reactions in photosynthesis. (5)

Ans Light Reactions:

- (i) When chlorophyll molecules absorb light, their energy level increases and their electrons are emitted.
- (ii) Electrons are passed to electron transport chain to produce ATP.
- (iii) Light also breaks water molecules (photolysis) and oxygen is released. The hydrogen atoms of water give electrons to chlorophyll and become ions.
- (iv) The electrons of chlorophyll, after production of ATP and the hydrogen ions of water are used for the reduction of NADP^+ into NADPH.

Q.7.(a) Write the role of pharynx and oesophagus in digestion of human food. (4)

Ans **Role of Pharynx:**

During swallowing, bolus is pushed to the back of mouth by tongue. When tongue pushes bolus, the soft palate also moves upward and to rear. In this way, the opening of nasal cavity is closed. When swallowed, the bolus passes pharynx to enter oesophagus. Pharynx has adaptations to prevent the entry of bolus particles in trachea (wind pipe to lungs). During swallowing, larynx (the top of trachea) moves upward and forces the epiglottis (a flap of cartilage) into horizontal position. Thus glottis i.e., the opening of trachea is closed. The beginning of swallowing action is voluntary, but once food reaches the back of mouth, swallowing becomes automatic.

Role of Oesophagus:

After being swallowed, food enters the tube called oesophagus, which connects pharynx to stomach. Neither pharynx nor oesophagus contributes to digestion and the previous digestive actions of saliva continue.

(b) What is meant by transpiration? Explain factors affecting the rate of transpiration. (5)

Ans For Answer see Paper 2017 (Group-I), Q.7.(b).